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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/609,392	07/03/2000	Hyeon Jun Kim	P-102	4315

7590 02/25/2005

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EXAMINER	
AMINI, JAVID A	
ART UNIT	PAPER NUMBER
2672	

DATE MAILED: 02/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/609,392	KIM, HYEON JUN	
	Examiner	Art Unit	
	Javid A Amini	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 September 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *22* is/are allowed.

6)☒ Claim(s) *1-12,25 and 27-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Arguments

Applicant's arguments filed 9/28/2004 have been fully considered but they are not persuasive.

Applicant on pages 11-12 third paragraph argues the term "search performance" is not essential to the practice of the invention, the search performance is just one of the advantage of certain embodiments of the invention. Therefore, the Examiner should be withdrawing the rejection 35 USC §112 first paragraph. Examiner's reply: The examiner withdraws the rejection under 35 USC §112 first paragraph, in respect to the Applicant's feedback on the "search performance".

Applicant on pages 12-13 argues in response to Examiner's question: What does Applicant try to claim in the claims 30 and 35 when N=1? Examiner acknowledges Applicant's respond of only one color is selected for extraction from the region when N=1. Examiner's reply: the rejection of claims 30 and 35 under 35 USC S112 second paragraph has been withdrawn.

Applicant on page 15, second paragraph argues the reference Graham fails to disclose dominant color setting method, which targets content-based retrieval for color in visual data. Examiner's reply: *Note: Visual element descriptor is considered to be color, spatial structure, shape and motion. Color composes of color space that is RGB, YCrCb, HSV (hue, saturation, value) and linear transformation matrix. Dominant color is to specify set of dominant color in a shape region, use color histogram and content-based retrieval. Color histogram is the percent of each color.* Graham in abstract teaches that a system and method for finding areas of similar color (ROI) in electronically captured spot color images and replacing the similar colors with a single dominant color. Graham in col. 3, lines 66-67 discloses a pallet of dominant colors is identified

based on the histogram classification. The color pallet is used to identify the dominant colors in the image. Graham in col. 4, lines 11-15 discloses the spatial areas are finally compared with the pallet of colors and the average noted color of the spatial areas are replaced with the closest corresponding pallet color. Graham in the abstract teaches each line of the original image is then scanned at a second resolution, the second resolution being substantially higher than the first resolution. The scanned lines are then processed to determine where within each line different colors exist. The locations of the different colors are noted using a break out box comprising a set of rules to evaluate each pixel. Graham illustrates in figs. 14 and 15 the horizontal and vertical skew correction in conjunction with the invention. But does not explicitly specify an accuracy of a color value representing the region.

Applicant on page 16 lines 3-11 argues that Graham is directed to a spot color extraction method and not to image characterization for image indexing and retrieval. Examiner's interpretation: each image is made of a plurality of spot color (pixel), Graham in the abstract discloses a system and method for finding areas of similar color in electronically captured spot color images (plural) and replacing the similar colors (plural) with a single dominant color.

Applicant on page 16, lines 9-11 argues the Examiner's rationale for modifying Graham in view of Qian is not applicable. Examiner's reply: Applicant on page 25 of specification lines 1-5 discloses the size of a region is computed by the counting of the pixels in the region. Applicant on page 11, lines 13-18 discloses a filter method for smoothing and burring a region when obtaining a dominant value. From the last paragraph, a person skill in the art would be associating the conserving computation/storage/noise to modify Graham in view of Qian, that is

to be invariant to certain types of transformation of the image, conserve computational and storage resources, be insensitive to noise.

Applicant on page 16 lines 16-21 argues the Graham fails to disclose a confidence measure extraction method. Examiner's reply: Graham in fig. 8A illustrates the box 816 represents an intensity tolerance T, and D represents the distance from the center to the back or front of the box measured in pixels.

Applicant on page 16 regarding claim 22 argues the Graham does not disclose determining a count sum of a confidence and pixels as an initial value corresponding to each region dominant color with respect to all region dominant colors and multiplying the coherence value and color pixel, adding a confidence to the multiplied value .... Examiner's reply: the rejection of claim 22 has been withdrawn.

Applicant on page 17 second paragraph regarding claim 25 argues the Graham does not disclose ... method between different retrieval systems, .. Examiner's reply: Graham in fig. 1 illustrates different system, scanner, printer, and a laptop. Graham in col. 5 lines 10-21 teaches the system processes 2 RGB data formats. One is 24-bit (different format) where there is a red, a green, and a blue byte. The other one is 32-bit (different format) where there is an alpha byte, a red, a green, and a blue. The alpha byte is actually unused. The 32-bit scheme is convention on the Macintosh.RTM., and permits loading and storage of RGB pixels as one 32-bit integer to speed-up processing. These type of data are processes and output as pallet images. A pallet image comprises an 8-bit (different format) per pixel image, thus, each byte represents one pixel. As discussed above, each 8-bit word is an index into a pallet of colors. Graham in fig. 2 box 210 illustrates comparing data. Graham in cols. 1 and 2 lines 66-67; 1-7 respectively discloses the

process of posterization is basically one of taking that true color image and converting (transforming) it to the closest match in a pallet by substituting the RGB pixel with the pixel in the pallet, or in the case of converting it to a pallet image, to replace it in the index. Graham in col. 8 lines 23-32 teaches conceptually, if the histogram has a peak, then a valley and another peak, the peak has a maximum number of values. As the topography is traversed, the cells will have lesser and lesser values in them until the bottom of the valley is reached. Then the search starts to go up the next slope, and the number of occurrences will go up. The search in that direction then stops, and all cells down until the valley are included. Going up again indicates that the search reaches another color cloud. Graham in fig. 1 box 102 illustrates sharing data format between a scanner and a laptop.

Applicant on page 17 third paragraph regarding claim 27 argues that Graham fails to disclose a method for describing dominant color of visual data. Examiner's reply: Graham in col. 3 lines 65-67 teaches a pallet of dominant colors is identified based on the histogram classification. The color pallet is used to identify the dominant colors in the image.

Applicant on page 17 the same paragraph argues the Graham does not disclose selecting a region of interest from media object. Examiner's reply: Graham in col. 6 lines 25-34 teaches using well-known techniques; the user is permitted to select an area, which he may want to perform the spot color extraction on. Alternatively, the entire prescanned spot image may be selected.

Applicant on pages 17 and 18 argues the reference Graham does not disclose the limitations in claim 27. Examiner's reply: Graham in fig. 9 illustrates number of colors (N), and there is more one color that means $N \geq 1$. For the rest of the limitations see claim 1 rejection.

Applicant on page 18 lines 6-8 regarding claim 27 argues the reference Qian fails to overcome the deficiencies of Graham. Examiner's reply: The reference Graham is silent about accuracy of a representative color value, however Qian in fig. 10, to overcome these limitations and to maintain a relatively compact matrix, the present inventors determined that the matrix should include smaller percentage ranges at the smaller percentages, with increasing percentage ranges toward the larger percentages. This maintains a small matrix, which is suitable for embedded systems, while providing more accurate discrimination between images with similar color content.

Applicant on pages 18-19 argues substantially similar to the previous arguments in this office action.

Examiner's suggestion: Applicant should be selecting detailed claim language, the present claim language is very broad and dominating the references claim invention. Examiner encourages Applicant to schedule an interview.

Allowable Subject Matter

Claim 22 allowed.

The following is an examiner's statement of reasons for allowance: **multiplying the coherence value and the color pixel, adding a confidence to the multiplied value and obtaining a confidence with respect to the region dominant color; and dividing the thusly obtained confidence value by a region size and extracting a confidence with respect to the image region.**

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1-12, 25 and 27-37 rejected under 35 U.S.C. 103(a) as being unpatentable over Graham et al. (herein after refers as a Graham), and further in view of Qian et al. (hereinafter refers as a Qian).

1. Claim 1,

"A dominant color setting method which generating a region dominant color descriptor incorporating information indicating a number of dominant colors with respect to a region of interest in visual data, at least one expressed dominant color, a frequency with which the dominant color appears in the region, and an accuracy of a color value representing the region". [Examiner's comments: Visual element descriptor is considered to be color, spatial structure, shape and motion. Color composes of color space that is RGB, YCrCb, HSV (hue, saturation, value) and linear transformation matrix. Dominant color is to specify set of dominant color in a shape region, use color histogram and content-based retrieval. Color histogram is the percent of each color.] Graham in abstract teaches that a system and method for finding areas of similar color (ROI) in electronically captured spot color images and replacing the similar colors with a single dominant color. Graham in col. 3, lines 66-67 discloses a pallet of dominant colors is identified based on the histogram classification. The color pallet is used to identify the

dominant colors in the image. Graham in col. 4, lines 11-15 discloses the spatial areas are finally compared with the pallet of colors and the average noted color of the spatial areas are replaced with the closest corresponding pallet color. Graham does not explicitly specify accuracy information. However Qian in col. 2, lines 7-21 teaches the coherence of the color of a picture element in relation to that of other picture elements in a contiguous region is determined. Even though the number of picture elements of each color is equal and, therefore, the color histograms are identical for two images, differences between features in the images will mean that the numbers of picture elements of each color, which are color coherent, will vary. Color coherence vectors do embed some spatial information in the descriptors. Qian in col. 4, lines 63-67 teaches the mean values of the individual red, green, and blue (RGB) pixels, a transform of the RGB pixel values or the mean color or the vector sum of the RGB intensity values might be used to describe the color of a test area of heterogeneous color. Also Qian in fig. 10, to overcome these limitations and to maintain a relatively compact matrix, the present inventors determined that the matrix should include smaller percentage ranges at the smaller percentages, with increasing percentage ranges toward the larger percentages. This maintains a small matrix, which is suitable for embedded systems, while providing more accurate discrimination between images with similar color content. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Qian into Graham in order to be invariant to certain types of transformations of the image, conserve computational and storage resources, be insensitive to noise, providing more accurate discrimination between similar color content and be easy to interpret in a normal sense.

2. Regarding Claims 2 and 10, Graham in col. 3, line 1 indicates the number of different color may actually be 8000 to choose from. And also see rejection of claim 1. The step of this claim the first dominant color descriptor and the second dominant color descriptor is obvious because applicant does not specify set of DC in a shape region, and the first dominant color descriptor could be a background color, and the second DC could be a shape region.

3. Claims 3 and 11

An expression of accuracy of the dominant colors as extracted by a certain method is obtained in accordance with a degree of confidence of the region dominant color descriptor. Graham in col. 5 lines 57-64 discloses the dominant colors are accomplished by creating "clusters" of colors that are related. This is done by taking the maximum occurrence and finding the colors around that maximum occurrence that are related and including the related colors in the color cluster. See rejection of claim 1.

4. Claim 4,

Graham in figs. 10 and 11 illustrates the broad claim language in claim 4. And also Graham in col. 4 lines 9-15 discloses Segments of each line are correlated with each other and with segments of adjacent lines to determine if the noted colors are in similar locations to thereby identify various spatial areas of color representing the original. The spatial areas are finally compared with the pallet of colors and the average noted color of the spatial areas is replaced with the closest corresponding pallet color.

5. Claim 5,

Graham in fig. 10 steps 1004-1016 illustrates matching the current color to the pallet color and resolved areas vertically and horizontally.

6. Claim 6.

A coherency value is used to represent the concentration degree of the pixels of a color with respect to the dominant color is adapted to the confidence. Graham in col. 4, lines 5-7 discloses the locations of the different colors are noted (e.g., stored in memory), using a break out box comprising a set of rules to evaluate each pixel.

7. Claims 7 and 8,

The step of claims 7 and 8 are obvious because Graham in figs. 14-15 illustrates an example of a horizontal and vertical skew correction.

8. Claim 9,Graham does not explicitly specify accuracy information includes to a confidence measure expressed by a vector value based on coherence value. However Qian in col. 2, lines 7-21 teaches the coherence of the color of a picture element in relation to that of other picture elements in a contiguous region is determined. Even though the number of picture elements of each color is equal and, therefore, the color histograms are identical for two images, differences between features in the images will mean that the numbers of picture elements of each color, which are color coherent, will vary. Color coherence vectors do embed some spatial information in the descriptors. Qian in col. 4, lines 63-67 teaches the mean values of the individual red, green, and blue (RGB) pixels, a transform of the RGB pixel values or the mean color or the vector sum of the RGB intensity values might be used to describe the color of a test area of heterogeneous color. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Qian into Graham in order to to be invariant to certain types of transformations of the image, conserve computational and storage resources, be insensitive to noise, and be easy to interpret in a normal sense.

9. Claims 10, 11 and 12

Applicant does not specify explicitly the claim invention. Applicant repeats the same procedures in claims. See rejection of claim 1.

10. The limitation as recited in claim 25 that is the method of transforming and searching a sharing data format using a region descriptor of each system. However this additional featured imitation of transforming and searching is described in the abstract of Graham Segments of each line are correlated with each other and with segments of adjacent lines to determine if the noted colors are in similar locations to thereby identify various spatial areas of color representing the original. The spatial areas are finally compared with the pallet of colors and the average noted colors of the spatial areas are replaced with the closest corresponding pallet color.

11. Claim 27, A method for describing dominant color of visual data, comprising: selecting a region of interest from a media object; and generating a dominant color descriptor for the region, said descriptor including": a) information indicative of a number of colors (N) selected for extraction from the region, where N _> 1"; b) information indicative of color values determined for respective ones of the N colors; c) information indicative of frequencies with which respective ones of the N colors appear in the region; d) information indicative of an accuracy of a representative color value for the region, said representative color value determined based on the information in at least one of b) and c).See rejection of claim 1.

12. Claim 28, The method of claim 27, wherein the color values in b) are determined based on any one of the following extraction methods: an average-color method; a method of expressing only one most frequency appearing color in the region; a method of expressing more than one most frequently appearing color in the region; a method of determining which colors

appear in the region more than a predetermined percentage of a threshold value; and a histogram method". Graham in col. 3, lines 53-68 discloses that the dimensions of the histogram may comprise other known image coordinate systems. A pallet of dominant colors is identified based on the histogram classification. The color pallet is used to identify the dominant colors in the image.

13. Claim 29, The method of claim 27, wherein the information in c) is determined based on pixel counts for respective ones of the N colors". Graham in abstract teaches this limitation.

14. Claim 30, see rejection of claim 1.

15. Claim 31, The method of claim 27, wherein the color values in b) are defined by at least one of color space information, Quantization information, color clustering information, and channel information. Graham in col. 5, lines 57-64 teaches the limitation.

16. Claim 32, see rejection of claim 12.

17. Claim 33, A method for describing dominant color in visual data, comprising: selecting a region of interest from a media object; and generating a dominant color descriptor for the region, said descriptor including": a) information indicative of at least one color selected for the region, b) information indicative of accuracy of a color value assigned to the region, said color value based on the information in (a). See rejection of claim 27.

18. Claim 34, It is obvious because, "A computer-readable medium for setting color information for visual data, having stored thereon": a) information indicative of a number of colors (N) selected for extraction from a region of a media object, where N >_ 1; b) information indicative of color values determined for respective ones of the N colors; c) information

indicative of frequencies with which respective ones of the N colors appear in the region"; d) information indicative of an accuracy of a representative color value for the region, said representative color value determined based on the information in at least one of b) and c). See rejection of claim 27.

19. Claim 35, see rejection of claim 1.

20. Claim 36, "The medium of claim 34, wherein the color values in b) are defined by at least one of color space information, quantization information, color clustering information, and channel information". Graham in col. 5, lines 57-64 teaches the limitation.

21. Claim 37, see rejection of claim 32.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Javid A Amini whose telephone number is 703-605-4248. The examiner can normally be reached on 8-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on 703-305-4713. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Javid A Amini
Examiner
Art Unit 2672

Javid Amini